IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicants	:	A. John Speranza et al.		
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TC/A.U.	:	1797		
Examiner	:	Ramillano, Lore Janet		
Docket No.	:	03-023 (PES-0296)		
Title:		SYSTEM FOR MAINTAINING HYDROGEN PURITY IN ELECTRICAL GENERATORS AND METHOD THEREOF		

APPEAL BRIEF

Sir:

This Appeal Brief is submitted in response to the Final Office Action dated September 5th, 2008.

1. THE REAL PARTY IN INTEREST

The real party in interest in this appeal is Proton Energy Systems, Inc. Ownership by Proton Energy Systems, Inc. is established by an assignment document recorded for this application on September 15, 2005, on Reel 016541 and Frame 0284.

2. RELATED APPEALS AND INTERFERENCES

None.

3. STATUS OF CLAIMS

Claims 10-13, 15-18 and 28-31 are pending and are the claims on appeal.

Claims 1-9, 14, 19-27, 32-43 have been cancelled.

Claim 16 is objected to due to the informality of omitting the modifier "currently amended" when claim language was changed in Applicants' reply dated May 27, 2008.

Claim 10-13 and 15-18 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

Claims 10-13, 15-18 and 28-31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Harada (U.S. Patent Publication 2003/0141200) in view of Brosnihan et al. (U.S. Patent Publication 2003/0090164) in further view of Gajjar et al. (U.S. Patent 4,891,629).

4. STATUS OF AMENDMENTS

Applicant submits that no amendments were filed subsequent to the Final Office Action.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 is directed to a system for maintaining hydrogen purity in an electrical generator. The system includes a hydrogen generator. See Figure 2 having a system 10 with a hydrogen generator 24 and paragraph [0021]. The system further includes a hydrogen cooled electrical generator coupled to receive hydrogen gas from the hydrogen generator by a gas conduit. See Figure 2 having a generator 12 coupled to the hydrogen generator 24 by a gas conduit 26, and paragraph [0021]. A vent line is directly fluidly coupled to the electrical generator on a first end and open to the atmosphere on a second end. See Figure 2 having a vent line 19 and paragraph [0021]. A valve is coupled to the vent line between the electrical generator and the vent line second end. See Figure 2 having a valve 20 and paragraph [0021]. The system also includes a hydrogen purity monitor operably coupled to the electrical generator and the valve. See Figure 2 having a purity monitor 18 and paragraph [0021]. The hydrogen purity monitor includes a means for transmitting a signal to the valve. See Figure 2 having a communications link 17, and paragraph [0021]. The system also includes a pressure transducer fluidly coupled to the conduit, where the pressure transducer transmits a signal to the hydrogen generator when the gas pressure in the electrical generator falls below a first threshold. See Figure 2 having a pressure transducer 30 and paragraph [0023]. The hydrogen generator produces hydrogen gas in response to the pressure transducer signal. See Figure 5 having a method 60 with a step 70 where the hydrogen generator 24 produces hydrogen gas in response to the pressure transducer 30 detecting a drop in pressure, and paragraph [0030].

Dependent Claim 11 depends directly from Claim 10 and is directed to a system where the valve releases hydrogen gas from the electrical generator to the atmosphere when the valve receives a signal from the hydrogen purity monitor. See Figure 2 having a valve 20 coupled by a communications link 17 to a purity monitor 18, and paragraph [0021]. See also Figure 5 having a method 60 including the steps of monitoring hydrogen purity in step 64 and opening a valve 20 in step 68, and paragraph [0029].

Dependent Claim 12 depends directly from Claim 11 and is directed to a system

where the hydrogen generator generates hydrogen gas at a second threshold pressure. See Figure 5 having a method 60 with a step 70 where the hydrogen generator 24 produces hydrogen gas to raise the pressure in the electrical generator 12, and paragraph [0032].

Dependent Claim 13 depends directly from Claim 12 and is directed to a system having a hydrogen generator that is an electrochemical generator having a polymer electrode membrane. See Figure 2 having a hydrogen generator 24 and paragraph [0022].

Dependent Claim 15 depends directly from Claim 13 and is directed to a system having a pressure monitor coupled to the electrical generator. See Figure 2 having a pressure monitor 16 connected to an electrical generator 12 and paragraph [0020].

Dependent Claim 16 depends directly from Claim 15 and is directed to a system having a hydrogen purifier coupled to the electrical generator. See Figure 2 having a purifier 22 coupled to the electrical generator 12, and paragraph [0018].

Dependent Claim 17 depends directly from Claim 12 and is directed to a system where the signal is provided to the valve when the purity of the hydrogen gas in the electrical generator is less than 99% pure. See Figure 2 having a valve 20 coupled to an electrical generator, and Figure 5 having a method 60 with a step 66 where the hydrogen purity it compared to a preferred purity level and step 68 where a control signal is passed to valve 20. See also paragraph [0028] and paragraph [0029].

Dependent Claim 18 depends directly from Claim 12 and is directed to a system where a signal is provided to the valve when the purity of the hydrogen gas in the electrical generator is less than 95% pure. See Figure 2 having a valve 20 coupled to an electrical generator, and Figure 5 having a method 60 with a step 66 where the hydrogen purity is compared to a preferred purity level and step 68 where a control signal is passed to valve 20. See also paragraph [0028] and paragraph [0029].

Independent Claim 28 is directed to system for maintaining hydrogen purity in an electrical generator. The system includes a hydrogen generator having a means for disassociating water into hydrogen and oxygen gas. See Figure 2 having a system 10 with a

hydrogen generator 24, and paragraph [0022]. The system further includes a hydrogen cooled electrical generator coupled to a turbine where the hydrogen generator is fluidly coupled to transfer hydrogen gas to the electrical generator by a gas conduit. See Figure 2 having a generator 12 coupled to the hydrogen generator 24 by a gas conduit 26, and paragraph [0021]. The system includes a vent line with a first end directly coupled to the electrical generator and a second end fluidly coupled to the atmosphere. See Figure 2 having a vent line 19 with one end connected to the electrical generator 12 and the second end open to the atmosphere, and paragraph [0021]. A valve is coupled to the vent line between electrical generator and vent line second end, the valve being arranged to release hydrogen gas at a predetermined pressure level. See Figure 6 having a method 80 and a step 92 where the valve 20 opens when the pressure is greater than a relief pressure. The system also includes a hydrogen purity monitor coupled to the electrical generator and the hydrogen generator. See Figure 3 having a purity monitor 18 coupled between the electrical generator 12 and the hydrogen generator 24, and paragraph [0025]. The system further includes a pressure transducer coupled to the conduit where the pressure transducer transmits a signal to the hydrogen generator when the gas pressure in the conduit falls below a threshold. See Figure 3 having a pressure sensor 30 and paragraphs [0023] – [0024].

Dependent Claim 29, which depends directly from Claim 28, is directed to a system having a hydrogen generator that produces hydrogen gas at a predetermined rate in response to a signal from the pressure transducer. See Figure 2 having a pressure transducer 30 and a hydrogen generator 24, and Figure 6 having a method 80 that includes a step 88 that generates hydrogen gas at a predetermined flow rate, and paragraph [0034].

Dependent Claim 30, which depends directly from Claim 28, is directed to a system where hydrogen gas is released by a valve when the gas pressure in the electrical generator exceeds 100 psi. See Figure 2 having a pressure transducer 30 and a hydrogen generator 24, and Figure 6 having a method 80 that includes a step 91 that compares a pressure relief setting to the pressure of the gas in electrical generator 12, and paragraphs [0035]-[0037].

Dependent Claim 31, which depends directly from Claim 29, is directed to a system where the hydrogen generator is an electrochemical generator having at least one polymer electrode membrane. See Figure 2 having a hydrogen generator 24 and paragraph [022].

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claim 10-13 and 15-18 are unpatentable under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

Whether Claims 10-13, 15-18 and 28-31 are unpatentable under 35 U.S.C. §103(a) over Harada (U.S. Patent Publication 2003/0141200) in view of Brosnihan et al. (U.S. Patent Publication 2003/0090164) in view of in further view of Gajjar et al. (U.S. Patent 4,891,629).

7. ARGUMENT

A. THE EXAMINER'S REJECTION OF CLAIMS 10-13 AND 15-18 UNDER 35 U.S.C. §112, SECOND PARAGRAPH IS IMPROPER

The Examiner's rejection Claims 10-13 and 15-18 under 35 U.S.C. §112, second paragraph is improper because Applicant submits that where the claims define patentable subject matter with a reasonable degree of particularity and distinctness, the claims should be allowed. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as may be desired. Claims should not be rejected if the expression selected by Applicant satisfies the statutory requirements. In viewing a claim for compliance with 35 U.S.C. §112, second paragraph, the claim as a whole must be considered to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the required notice function. MPEP 2173.02. (Emphasis in the original).

The Examiner rejected Claim 10 as being indefinite because the claim language uses the term "said electrical generator" and "said hydrogen cooled generator". Applicant respectfully submits that the present Application is directed to a system having an electrical generator having windings that are cooled with hydrogen gas. See Present Application, Paragraph [0001]. Applicant respectfully submits that the claimed subject matter needs to reasonably convey to one skilled in the art with a reasonable degree of particularity and distinctness. One of ordinary skill in the art knows that a hydrogen cooled generator is an electrical generator and that they are the same thing. Therefore, Applicants submit that independent Claim 10 is defined with a reasonable degree of particularity

In view of the foregoing, Applicant respectfully submits that the claimed subject matter is described in such a manner that reasonably conveys to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention, defined the claimed subject matter with a reasonable degree of particularity and distinctness, and therefore respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §112, second paragraph, which Applicant considers to be

traversed.

B. THE EXAMINER'S REJECTION OF CLAIMS 10-13, 15-18 AND 28-31 UNDER 35 U.S.C. §103(A) IS IMPROPER

The Examiner's rejection 10-13, 15-18 and 28-31 Under 35 U.S.C. §103(a) based on Harada in view of Brosnihan et al. and Gajjar et al. is improper because (i) the references do not teach each and every limitation of claims 10-13, 15-18 and 28-31, and (ii) the combination of the references would fail to perform as the claimed invention would perform.

Applicant will now explain why the references do not teach each and every limitation of Claims 10-13, 15-18 and 28-31. Claims 10-13, 15-18 and 28-31 stand or fall together as a group.

Independent claim 10 and independent Claim 28, recite in part:

". . . a hydrogen cooled electrical generator . . . said electrical generator fluidly coupled to receive hydrogen gas from said hydrogen generator by a gas conduit;"

"a vent line having a first and second end, said first end being directly fluidly coupled to said electrical generator and said second end being fluidly coupled to the atmosphere . . ." and,

". . . a hydrogen purity monitor operably coupled to said electrical generator . . ."

Referring to Harada et al., the Examiner states that an electrical generator is disclosed that is coupled to a hydrogen generator by a conduit. In an attempt to find an "electrical generator" coupled to a hydrogen generator by a "gas conduit", the Examiner relies on a line shown in Figure 13 of Harada. See Final Office Action, page 3, paragraph 7, lines 8-9. Applicant notes, however, that the line referenced in the Figure 13 is not a gas conduit, rather this line indicates an electrical connection from a power source (261) to the hydrogen generator. See Harada, Paragraph [0176], Page 12. In order to disassociate water into hydrogen and oxygen gas, electrolysis requires an electrical power source. The electrolyzer uses the electrical power, in the presence of a catalyst to generate the hydrogen

and oxygen gas.

Independent Claims 10 and 28 in contrast includes the limitation that the electrical generator is fluidly coupled to receive hydrogen gas from the hydrogen generator. The flow of hydrogen to the electrical generator is important as the gas is used to cool the windings within the electrical generator. See Present Application, Paragraph [0017]. While the Examiner is entitled to give claim terms their broadest reasonable interpretation, Applicant submits that it is not reasonable to interpret a power supply that provides electrical power to an electrolysis cell as being an electrical generator that is fluidly coupled to receive hydrogen gas from a hydrogen generator. Further, if the power source (261) cited by the Examiner is arranged as proposed, Applicant submits that the system taught by Harada would not function, certainly not function as intended, since electrolysis cell would not have a power supply to provide the energy for disassociation of water. Applicant further submits that the line referenced by the Examiner cannot function simultaneously as both an electrical connection and a hydrogen gas conduit. Accordingly, Applicant submits that the Harada fails to disclose an electrical generator fluidly coupled to receive hydrogen gas from a hydrogen generator as claimed in independent Claims 10 and 28.

The Examiner also states that Harada discloses a vent line coupled to the electrical generator. See Final Office Action, page 3, paragraph 7, lines 10-14. As discussed above, the line illustrated in Figure 13 of Harada is an electrical connection from a power source that provides electrical energy to the electrolysis cell. See Harada , Paragraph [0176], Page 12. Since this line represents an electrical connection, there is no fluid connection between the power source (261) taught by Harada and the atmosphere. Applicant submits that an electrical connection would fail to provide the intended functionality of the vent line, namely to allow contaminated hydrogen gas to be released from the electrical generator. Therefore, Applicant respectfully submits that Harada fails to disclose a vent line as claimed in independent Claims 10 and 28.

The Examiner further states that Harada discloses a purity monitor (235) operably coupled to the electrical generator. See Final Office Action, page 3, paragraph 7, line 14,

through page 4, lines 1-2. In an attempt to find a "purity monitor", the Examiner is relying on a a resistivity meter disclosed by Harada. The resistivity meter that is coupled to a water loop between the high pressure oxygen tank (240) and the water feed tank (241). See Harada, paragraph[0187]. The resistivity meter taught by Harada is used to determine the quality of the water, to determine if ion-exchange treatment is needed. See Harada, paragraph [0189]. Applicant respectfully submits that the disclosure of a water quality meter is not a purity monitor coupled to an electrical generator as claimed in independent Claims 10 and 28. The resistivity meter relied upon by the Examiner fails perform the intended function of determining the contamination level of hydrogen gas in an electrical generator.

In response to the Applicant's previous assertions that a resistivity meter is not a hydrogen purity meter, the Examiner has stated that when given its broadest reasonable interpretation, a hydrogen purity meter encompasses a resistivity meter. Applicants respectfully disagree. Independent Claims 10 and 28 each include the limitation that the hydrogen purity meter is coupled to the electrical generator. The resistivity meter relied upon by the Examiner is coupled to the water loop of the electrolysis cell. Harada does not disclose, teach or suggest the claimed limitation of coupling the hydrogen purity meter to an electrical generator. Additionally, a resistivity meter is not a hydrogen purity meter. The resistivity meter measures water quality. This parameter is measured to determine of ion-exchange treatment is needed. The ion-exchange treatment is done for the purpose of electrolysis efficiency, and does not affect the purity of the hydrogen. Water in need of treatment would still disassociate, though it may utilize more electrical power to maintain output. Therefore, since the resistivity meter does not measure parameters related to the quality or purity of the hydrogen, the Examiners position is not a reasonable interpretation. Therefore, Applicant submits that Harada fails to disclose a hydrogen purity monitor as claimed in independent Claims 10 and 28.

Applicant respectfully submits that Brosnihan et al. does not cure these deficiencies. The Examiner states that it would have been obvious to one of ordinary skill in the art to couple the hydrogen cooled generator of Brosnihan et al. in place of the electrical generator

disclosed by Harada. See Final Office Action, page 5, lines 6-9. As discussed above, the connection between the electrolyzer and the power source taught by Harada is an electrical connection to provide a source of electrical energy to the electrolysis cell. Therefore, electricity flows from the power source to the electrolysis cell. If the hydrogen cooled electrical generator taught by Brosnihan et al. is substituted for the power source of Harada, there would still be only the flow of electricity from the hydrogen cooled generator to the electrolysis cell. There simply is no teaching or suggestion of changing the coupling taught by Harada to be a fluid gas conduit that transfers hydrogen gas to a source of electrical energy.

In response to the Applicant's previous arguments that the proposed combination of Harada and Brosnihan would not perform as the claimed invention performs, the Examiner reasserts that it would have been obvious at the time of the invention to substitute the power supply of Harada with the hydrogen cooled generator or Brosnihan. See Final Office Action, page 6, paragraph 8, lines 3-15. In support of this argument, the Examiner states that the test for the proposed combination is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Citing In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Applicant respectfully submits that the proposed combination of Harada and Brosnihan would not reasonably suggest one of ordinary skill in the art that a connection to be changed from an electrical connection with energy glowing in one direction to a hydrogen gas conduit with gas flowing in a direction opposite the electrical energy. Applicant submits that one of ordinary skill in the art with common sense would not look to make a substitution where the commodity (hydrogen gas vs. electricity), direction (flowing into vs. out of), and the function (operational power vs. cooling) are changed or reversed, especially as such a change would cause the electrolysis cell to stop working as discussed above.

Accordingly, Applicant submits that the proposed combination of Harada and Brosnihan would fail to perform as the claimed invention of independent Claims 10 and 28 performs.

Applicant submits that the addition of Gajjar et al. also fails to cure this deficiency. Gajjar et al. is relied upon by the examiner to provide a turbine generator in reference to a limitation of Claim 28 which provides in part:

> ". . . a hydrogen cooled electrical generator coupled to a turbine, said hydrogen generator being fluidly coupled to directly transfer hydrogen gas to said hydrogen cooled electrical generator by a gas conduit . . ."

However, Gajjar et al. does not disclose, teach or suggest the claimed limitations discussed above regarding the coupling of the hydrogen generator to an electrical generator, the coupling of a vent to an electrical generator or the coupling of the purity monitor. Accordingly, Applicant submits that the proposed combination of Harada , Brosnihan and Gajjar would fail to perform as the claimed invention of independent Claims 10 and 28 performs.

Accordingly, because the combination of Harada, Brosnihan et al. and Gajjar et al. do not teach each and every limitation of independent Claims 10 and 28 and claims 11-13, 15-18 and 29-30 that depend from Claims 10 and 28, Applicant submits that the rejection of claims 10-13, 15-18 and 28-30 under 35 U.S.C. §103(a) based on these references is improper.

C. CONCLUSION

In view of the foregoing arguments, applicant respectfully submits that the recited claims are novel and unobvious. Further, a reversal of the rejections of record, or such recommendation or relief as equity may require, is respectfully requested.

Respectfully Submitted,

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Date: December 22, 2008

CLAIMS APPENDIX

10. A system for maintaining hydrogen purity in an electrical generator, the system comprising:

a hydrogen generator;

a hydrogen cooled electrical generator, said electrical generator fluidly coupled to receive hydrogen gas from said hydrogen generator by a gas conduit;

a vent line having a first and second end, said first end being directly fluidly coupled to said electrical generator and said second end being fluidly coupled to the atmosphere;

a valve coupled to said vent line between said hydrogen cooled generator and said vent line second end;

a hydrogen purity monitor operably coupled to said electrical generator and said valve, said hydrogen purity monitor including means for transmitting a signal to said valve; and,

a pressure transducer fluidly coupled to said conduit, said pressure transducer transmitting a signal to said hydrogen generator in response to the gas pressure in said electrical generator falling below a first threshold wherein said hydrogen generator produces hydrogen gas in response to said pressure transducer signal.

11. The system of claim 10 wherein said valve operates to release hydrogen gas directly from said electrical generator to the atmosphere in response to a signal from said hydrogen purity monitor.

12. The system of claim 11 wherein said hydrogen generator is configured to generate hydrogen gas at a second threshold pressure, said hydrogen generator producing hydrogen gas in response to a reduction in pressure in said electrical generator.

13. The system of claim 12 wherein said hydrogen generator is an electrochemical generator having at least one polymer electrode membrane.

15. The system of claim 13 further comprising a pressure monitor coupled to said hydrogen cooled electrical generator.

16. The system of claim 15 further comprising a hydrogen purifier coupled to said electrical generator.

17. The system of claim 12 wherein said hydrogen purity monitor provides a signal to said valve when the purity of hydrogen gas in said electrical generator is less than 99% pure.

18. The system of claim 12 wherein said hydrogen purity monitor provides a signal to said valve when the purity of hydrogen gas in said electrical generator is less than 95% pure.

28. A system for maintaining hydrogen purity in an electrical generator, the system comprising:

a hydrogen generator, said hydrogen generator having means for disassociating water into hydrogen and oxygen gas;

a hydrogen cooled electrical generator coupled to a turbine, said hydrogen generator being fluidly coupled to directly transfer hydrogen gas to said hydrogen cooled electrical generator by a gas conduit;

a vent line having a first and second end, said first end being directly fluidly coupled to said hydrogen cooled electrical generator and said second end being fluidly coupled to the atmosphere;

a valve coupled to said vent line between said hydrogen cooled electrical generator and said vent line second end, said valve being configured to release hydrogen gas from said electrical generator through said vent line at a predetermined hydrogen gas pressure level;

a hydrogen purity monitor operably coupled to said electrical generator and said hydrogen generator; and,

a pressure transducer fluidly coupled to said conduit, said pressure transducer transmitting a signal to said hydrogen generator in response to the gas pressure in said electrical generator falling below a first threshold wherein said hydrogen generator produces hydrogen gas in response to said pressure transducer signal.

29. The system of claim 28 wherein said hydrogen generator produces hydrogen gas at predetermined rate in response to a signal from said pressure transducer.

30. The system of claim 28 wherein said valve releases hydrogen gas when the gas pressure in said electrical generator exceeds 100 psi.

31. The system of claim 29 wherein said hydrogen generator is an electrochemical generator having at least one polymer electrode membrane.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.